

Non-Doped Light-Emitting Electrochemical Cells based on fluorescent small organic molecules

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Light-emitting electrochemical cells are considered to be the future generation of lighting sources. When compared to any other solid state lighting devices, simple device architecture and air stable electrodes makes LECs impressive. In particular much research have been focused on cationic iridium complexes. But the rare and expensive nature of iridium demands new emitters in this field. So here we introduce a LEC device based on strongly luminescent phenanthroimidazole derivative having different side chains as a sole active component. The device structure was literally similar to a conventional LECs. For the neutral compounds based devices, the active layer consist of a tricomponent blend of organic molecule along with polyethylene oxide (ion transporting polymer) and Lithium triflate (inorganic salt). In contrast, the ionic compounds were applied as such without any other additional salts. Our best device achieved a brightness of around 711 cd/m^2 at around 9.9 V on a voltage sweep. The J-V characteristics reveals that the active material possesses good charge transporting ability, which is critical for electroluminescent devices.